



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------------|-------------|----------------------|---------------------|------------------|
| 10/601,780 | 06/23/2003 | Makoto Nakamura | Saigoh C-302 | 9523 |
| 23474 | 7590 | 10/05/2005 | EXAMINER | |
| FLYNN THIEL BOUTELL & TANIS, P.C. | | | COMPTON, ERIC B | |
| 2026 RAMBLING ROAD | | | ART UNIT | |
| KALAMAZOO, MI 49008-1631 | | | PAPER NUMBER | |

3726

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/601,780

Applicant(s)

NAKAMURA, MAKOTO

Examiner

Eric B. Compton

Art Unit

3726

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>6/23/03</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claim 3 is objected to because of the following informalities: in line 3, "bore" should read --core--. Appropriate correction is required.
2. Claim 8 is objected to because of the following informalities: in line 6, "core pin" should read --pin hole--. See also same limitation in claim 10, line 5 and claim 11, line 5. See Specification [0033] (suggestion the pin hole is cut but not the core pin). Appropriate correction is required.
3. Claim 13 is objected to because of the following informalities: in line 2, "mold" should read --core--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3-4, 6, 9 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Pat. 6,422,755 to Cadle et al.

Regarding claims 1 and 9, Cadle discloses a method (see Figs. 31 –32) for manufacturing a crankshaft supporter (see e.g., Col. 1, lines 35-44) which attaches to a

Art Unit: 3726

cylinder head of a vehicle engine to rotatably support a crankshaft therebetween, comprising the steps of:

providing a preform (654) having a center bearing section connected between a pair of side sections each having a pin hole (666) extending therethrough;

providing a mold (see Fig. 31) having a mold cavity corresponding to the shape of the crankshaft supporter;

providing a plurality of core pins (655, 657) each having a pin insert section (662) which is sized to be insertable into one of said pin holes and an enlarged head section (658) which has a cross section greater than the cross section of the pin hole so that the head section is adapted to abut a peripheral surface of the preform;

inserting at least one core pin into each said pin hole so that the head section of each core pin abuts a peripheral surface of the preform adjacent an open end of the pin hole;

positioning the preform and the core pins inserted therein within the mold cavity so that the head sections of the core pins engage a boundary wall defining the mold cavity so as to stationarily support the preform within the mold cavity in defined spaced relationship from the boundary wall;

supplying molten metal into the mold cavity to surround the preform and define the crankshaft supporter;

removing the molded crankshaft supporter, with the preform embedded therein, from the mold cavity; and then

Art Unit: 3726

forming a through supporter generally in hole through the crankshaft alignment with the pin hole. Note: the through hole is finished with threads as shown in Fig. 29.

Cadle discloses "It is difficult to accurately position the insert within the die cast mold since the mold is open at insertion and closed during casting. The integral dowels solve this problem by both locating the bearing cap during mode closure and sealing off the bolt holes from molten aluminum." Col. 10, lines 40-44. "The shoulders 658, 660 on the right hand set of pins 662, 664 crush the integral cone-shaped dowels 670 to create a seal between the pins and the holes 666. The seal prevents the molten aluminum 674 from entering the holes 666. *This action causes precise location of the cap 654 and eliminates the need for expensive drilling-out of aluminum flash that otherwise enters the bolt holes 666 where it solidifies.*" *Id.* at lines 58-65 (emphasis added). This is precisely the goal Applicant seeks. See Specification at [0011-0012].

Regarding claims 3 and 12, see Fig. 32 of Cadle (showing pair of core pins opposing inserted into core hole.

Regarding claim 4, the mold shown in Figure 31 of Cadle appears to show a recess to position preform.

Regarding claim 6, the assembly of Cadle is configured to accommodate a crankshaft bearing.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Cadle.

AAPA, as found on pages 13 of the Specification and Figure 5, discloses the conventional method for forming crankshaft supporters. A core is inserted into a mold, where it the support is casted. The core pin are tapered. With tapered core pins, "[t]he core is stably positioned in a vicinity to prevent inward or outward deformation of the core by pressure of the molten metal."

However, AAPA does not disclose the core pin having "a head section in contact engagement between an outer surface of the said preform and a surface of said mold."

Cadle discloses the invention cited above, including the feature of providing the core pins with a head section in contact engagement between an outer surface of the preform and a surface of the mold. Cadle discloses "It is difficult to accurately position the insert within the die cast mold since the mold is open at insertion and closed during casting. The integral dowels solve this problem by both locating the bearing cap during mode closure and sealing off the bolt holes from molten aluminum." Col. 10, lines 40-44. "The shoulders 658, 660 on the right hand set of pins 662, 664 crush the integral

Art Unit: 3726

cone-shaped dowels 670 to create a seal between the pins and the holes 666. The seal prevents the molten aluminum 674 from entering the holes 666. *This action causes precise location of the cap 654 and eliminates the need for expensive drilling-out of aluminum flash that otherwise enters the bolt holes 666 where it solidifies.*” *Id.* at lines 58-65 (emphasis added). This is precisely the goal Applicant seeks. See Specification at [0011-0012].

Regarding claims 1 and 9, it would have been obvious to one having ordinary skill in the art at the time of invention to have formed the core pins of AAPA having “a head section in contact engagement between an outer surface of the said preform and a surface of said mold,” in light of the teachings of Cadle, in order to precisely locate the bearing preform and to prevent flash from entering the pin hole.

Regarding claims 2, 8, and 10-11, AAPA discloses, “After casting with the core pins 128, 130 inserted into the pin hole 116, the through hole 118 is cut and shaped by drilling.” As shown in Figure 5, the through hole is larger in diameter of the diameter of the core pin at any portion along its length (including the area above the core).

Specification, page 3. Apply this to the instant invention, the through holes would be formed larger in diameter than the pin hole, and past the area of the core pin heads.

Regarding claims 3 and 12, see Fig. 32 of Cadle (showing pair of core pins opposing inserted into core hole).

Regarding claim 4, the mold shown in Figure 31 of Cadle appears to show a recess to position preform.

Regarding claims 5 and 13-14, AAPA, as found on page 1 of the Specification and Figure 5, discloses conventional casing of a crankshaft supporter, wherein the core pins are tapered. With tapered core pins, "[t]he core is stably positioned in a vicinity to prevent inward or outward deformation of the core by pressure of the molten metal." With regards to ribs, this feature only allows for changing the surface area of the pin in contact with the core, and is an optimization within prior art conditions or through routine experimentation. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 6, the assembly of Cadle is configured to accommodate a crankshaft bearing.

Regarding claim 7, AAPA, as found on page 2 of the Specification, discloses that in the conventional method of forming a crankshaft supporter, an alumina fiber preform is used in order to "reduce expansion of an oil clearance resulting from thermal expansion of the of the bearing holding section." *Id.*

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Compton whose telephone number is (571) 272-4527. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David p. Bryant can be reached on (571) 272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Eric B. Compton
Primary Examiner
Art Unit 3726

ebc